

## SPECIFICATIONS FOR 200-TON ROLLER ASSEMBLY

### 1. SCOPE

1.1 Description of item. This specification is for 150ea 200-ton flat-topped roller assemblies. The roller assemblies are used to move vessel hull sections while in dry dock, and are submerged in salt water during vessel dockings. Figure (1) shows a general overview of a roller assembly used on Shipyard "track".

1.2 Quantities. The roller assembly quantity required is listed in the contract documentation.

### 2. APPLICABLE DOCUMENTS

#### 2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise stated, the following specifications and standards of the Department of Defense Index of Specifications and Standards (DoDISS) are applicable and required for this solicitation, per the latest revision of DoDISS.

MIL-STD-792F Special Purpose Components, Identification Marking Requirements.

2.2 Other publications. The following document forms a part of this specification to the extent specified herein.

AMERICAN WELDING SOCIETY, INC. (AWS) D1.1 – Structural Welding Code.

(Applications for copies should be addressed to the American Welding Society, Inc., 2501 N.W. 7th Street, Miami, FL 33125)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

2.4 Figures. The figures of this specification are not to scale.

### 3. REQUIREMENTS

3.1 General. Two hundred ton capacity roller assemblies shall meet the requirements as described in this specification and final design drawing specified in paragraph 4.2.

3.1.1 Roller Assembly. Each roller assembly consists of a low-profile housing, a chain, (2) cam blocks, and (4) cam rollers as detailed in figures 2-4, and as detailed in this specification.

3.1.2 Housing. The housing consist of (1) flat top-plate, (2) side-plates, (2) end plates, and (1) load-plate. The roller assembly housing shall be of all welded construction. Top plate shall have 4 each ¼" diameter thru holes for draining.

- 3.1.3 **Load plate.** The load plate shall have a machined groove for guiding the roller chain. The groove shall be integral with the load plate material. The load plate weld to the side plate shall be capable of supporting a 130,000 pounds lateral load without yielding. The hardness requirements for the bearing surfaces on the load plate are Rockwell HRC 39 minimum and HRC 45 maximum. The load plate shall meet the requirements of paragraph 3.7.2 at specified hardness.
- 3.1.4 **Chain.** Each roller assembly shall be equipped with (1) each endless roller chain that rotates about the load plate. The chain shall be stainless steel and have only one master link allowing ease of removal. The roller bearing shall be between HRC 42 minimum to HRC 48 maximum.
- 3.1.5 **Cam blocks.** Each roller assembly shall have (2) each bolt-on cam blocks for installation of the cam rollers.
- 3.1.6 **Cam rollers.** Each roller assembly shall have (4) bolt-in cam rollers with a 3-inch diameter roller. The cam rollers shall be McGill part# CF-3-SB or 25260 Static Capacity Smith Bearing PN CR-3-XB. Each cam roller shall have a hexagonal hole in the face of the stud for installation and removal.
- 3.1.7 **Vendor responsibility.** All items not explicitly identified in this specification are the vendors' responsibility (in other words, material specifications, material thickness, etc.). The vendor drawing specified in section 4.2 becomes part of the specification upon approval by the government. After drawing approval the vendor may not make any changes that would affect any aspects of the drawing without acceptance from the government.
- 3.2 **Performance requirements**
- 3.2.1 **Roller Assembly Load capacity.**
- 3.2.1.1 **Vertical.** The roller assembly shall have a minimum working vertical load carrying capacity of (200) short ton.
- 3.2.1.2 **Motive force.** The roller assembly shall require not more than (50) pounds horizontal motive force per short-ton of load supported.
- 3.2.1.3 **Jacking force.** The end plates and/or cam blocks shall be designed to withstand a 200,000-pound jacking force applied horizontally to the midpoint of the item while the roller housing is restrained from movement. The bearing area of the jack is 5-inches in diameter.
- 3.2.1.4 **Operation.** The roller assembly shall move easily when pushed by hand when on a flat, level surface (with cam rollers removed).

### 3.2.2 Chain.

3.2.2.1 Operation. The chain shall rotate freely about the load plate when pushed by hand while the roller is in an inverted position. The chain shall not be oversized such that it can ride up on the shoulders of the load plates machined groove due to side drift. Chain linkage components shall not contact the surface of any portion of the housing, including attachment welds, regardless of the chains lateral position within its operating envelope.

3.2.2.2 Installation/removal. The chain shall be capable of installation on and removal from the load plate by hand, without the use of specialized tools. An access notch in the middle of each side plate shall be provided to allow chain removal and installation. Slack between chain and load plate, when chain is freely hanging under its own weight, shall be 1-1/16" +/- 1/8".

### 3.3 Corrosion protection.

3.3.1 Performance. The roller assembly shall be painted to withstand repeated submergence under load in salt water without degradation of operation. Paint color shall be gray.

3.3.2 Unprotected areas. Corrosion protection (i.e. paints; tape, etc.) shall not be applied to the cam rollers, the roller chain, or the bearing surfaces of the load plate.

3.4 Threaded connections. Threaded connections shall have "anti-seize" or similar lubricant liberally applied prior to final assembly. Cam blocks shall be drilled and tapped for set screw that bears on the non-threaded section of the cam stud.

3.5 Identification. Each housing and corresponding cam blocks shall be permanently marked with a unique serial number that includes the date. Markings shall be in ¼-inch high letters and in accordance with MIL-STD-792F for low stress die stamps. Figure 2 shows the marking locations.

### 3.6 Workmanship.

3.6.1 Steel fabrication. The steel used in fabrication shall be free from laminations, kinks, warp-age, or other conditions that would be deleterious to the finished product.

3.6.2 Surface finish. Remove all sharp corners and rough edges from roller assembly, including components, which are liable to cause injury to personnel or damage to equipment. For rollers and load plate machined groove break only the sharp edge DO NOT CHAMFER.

#### 3.6.3 Welding.

3.6.3.1 Welder qualifications. All welders shall be qualified for the types of welds and for welding positions required for use in the fabrication of each unit. Qualification shall be on the type of base material and filler utilized in actual construction or on similar alternate materials not requiring operator requalification. Welder qualifications shall be performed in accordance

with the sections of AWS D1.1. Copies of the qualifications record for each qualified welder shall be kept by the manufacturer or contractor and shall be available to authorized government inspectors.

- 3.6.3.2 **Weld Quality.** Surfaces to be welded shall be free from foreign matter that would be injurious to the weld. Welding procedures, inspection, and corrective welding, shall be in accordance with AWS D1.1. Welding shall be accomplished so as to prevent permanent distortion of the connected parts. All welds shall be free of porosity and cracks.

3.7 **Material.**

- 3.7.1 **Quality.** Materials used shall be free from defects that would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice.
- 3.7.2 **Special provision.** Materials selected shall have a high to moderate resistance to stress corrosion cracking from a salt-water environment. The roller bearing shall have at least moderate resistance to stress corrosion cracking from a salt-water environment.
- 3.7.3 **Recovered Materials.** Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials that have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products are allowed under this specification unless otherwise specified.

**DESIGN DRAWINGS, CERTIFICATION**

- 4.1 **Conceptual drawing is required per the proposal submittal requirements section of the solicitation.**
- 4.2 **Final Design Drawing requirements.** Within (30) days of contract award, but prior to manufacturing, the vendor shall provide a final design drawing of the roller assembly including chain, which is based on the conceptual drawing. Acceptance of this drawing by the Government shall not constitute a loss of responsibility of the contractor to ultimately meet all of the requirements of this specification. **Final drawings shall be ANSI Y14.1 size C or larger and, in addition to the conceptual drawing items listed in the proposal submittal requirements, shall contain the following items as a minimum:**
- A. Critical clearance areas between the chain and housing**
  - B. Weld sizes**

**C. Weld locations**

**D. ALL material specifications including applicable heat-treating and hardness ranges**

- 4.3 Load capacity certification. Vendor shall supply certification that the roller assembly is a) designed for load testing to 130% of the rated capacity of 200-short ton and b) capable of not requiring more than 50 pounds load horizontal motive force per short-ton of load applied.

**5 PROCUREMENT QUALITY ASSURANCE, INSPECTION AND ACCEPTANCE**

- 5.1 **ACCEPTANCE AT DESTINATION-** Final acceptance of the equipment furnished per this specification shall be made at destination by the PSNS & IMF cognizant engineer for the equipment. Acceptance shall be based upon critical attributes provided on figure 5, satisfactory completion of nondestructive testing, dimensional inspection, operational testing and visual inspection at destination, acceptability of the drawings and manuals required by this specification.